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OHIO POTATO CULTIVAR TRIALS

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STATEWIDE TRIALS - 1989

INTRODUCTION

The purpose of the statewide variety trials is to test new varieties for the benefit of Ohio growers under various farm conditions. Cultural and pest control practices in each case are those used by the cooperating grower. Stand, vigor, plant characteristics, diseases, and maturity were recorded in the fields. At harvest the tubers were evaluated, weighed, and graded, with samples taken for chipping tests.

Thirteen cultivars were planted at each of five farms. These farms were selected to give different soil and climatic conditions. The cultivars were selected either because they looked promising in previous statewide trials, and in the observation trials on two cooperating farms or were selected from the cultivar plots at the Ohio Agricultural Research and Development Center (OARDC), Wooster.

Farm Locations

The five farms referred to in the introduction are as follows:

Farm 1 (M) - Michael Farms, Urbana, Ohio, Champaign County -- main plots plus russet plots.

Farm 2 (Th) - Thompson Farms, Hanoverton, Ohio, Columbiana County -- main plots plus observation plots.

Farm 3 (Mel) - Mellinger Farms (Crystal Springs Farm), Leetonia, Ohio, Columbiana County -- main plots plus observation plots.

Farm 4 (L) - Logan Farms, Mt. Gilead, Ohio, Morrow County -- main plots plus two additional entries.

Farm 5 (C) - Chase Farms, Defiance, Ohio, Defiance County -- main plots plus russet plots.

See Table 1 for summary of cultural practices followed on these cooperating farms -- planting dates, harvest dates, and related information.

Procedures

Thirteen cultivars were planted in three replicates on each of the five farms. In addition, seven additional cultivars were planted for observation in smaller triplicated plots on Farms 2 and 3. Also, six Russet cultivars were planted on Farms 1 and 5. Two other additional entries were likewise planted on Farm No. 4. In the main trials, eighty seed pieces were planted in each replicate and in the other trials fifty each were used.

The seed potatoes were cut and treated on May 2, 3 and 4th. Planting within the next few days was expected. However, rains delayed all planting. All farm plots were harvested from Sept. 27 to Oct. 5, thus making the growing season rather short. The growers' planters were used by driving very slowly. The potatoes were harvested with old flat bed diggers then picked up and weighed. A representative 50 lb. sample was then graded with 10 tubers cut for internal defects. A sample of each cultivar from four farms was then taken to O.S.U. for chip tests.

Atlantic, Norchip and Katahdin were used for comparison in the Main trials, Superior and Kennebec in the Observation trials and Russet Norkotah in the Russet trials.

Weather and Growing Conditions

The last three winters were unusually warm and dry. The 1988 growing season was the hottest on record in Ohio. Rains began in late April of 1989 and after early May were almost continuous thru May and June. Planting was delayed in general and was often done when fields where too wet. Many seed pieces rotted with poor stands resulting. This often occurred on well drained land where no such problem had ever before occurred.

On Farm 2, two-thirds of the replicates were completely lost on such land. Because of poor yields, potatoes from this farm were not graded. On Farm 3 one-third were lost. Some losses also occurred on Farms 1 & 5. On all farms except possibly Farm 4, more extreme differences were seen in both yield and grade in the replicates of many entries than has ever been observed in 27 years of field trials. Most of the lower yields and grades in the replicates of any one cultivar were unquestionably due to moisture and soil conditions rather than to characteristics of the entry. Extreme variations were frequently noted in one replicate of 20 to 30 feet of a row. In general all yields were low. What all of this means is that the results obtained in Ohio in 1989 may or may not be indicative of the capability of any one cultivar when a more normal season should be expected.

Field Observations

The average stand for all entries on four farms was 84%, one of the lowest on Ohio testing records (Table 3). The mean for the last 15 years is 89% The mean stand for the Observation trials was 85% and for the Russet trials at Farm 5, 84%. Stand counts were not taken at Farm 1 because of wet conditions.

No plant disease of any kind worthy of mention was found on Farm 2 and 3.

The most severe problem was soil compaction and plant stress due to the wet season. A rainy May and June caused poor root system development. In some cases a week or two of dry weather in July and August injured the plants and reduced tuber growth.

Maturity records obtained in early September before the plants were chemically killed, were of little value due to the unusual environmental conditions already described. With late planting and with some rains in late August and early September, many early and medium-early plants were still green.

GRADES AND YIELDS

The major external tuber defects were misshapen, second growth, greening and growth cracks, with some scab on 3 of the 4 farms where the tubers were graded. In most cases the grades were not unusually low.

Total and U.S. No. 1 yields with other data are shown in Tables 5-7. The yields of many cultivars varied greatly from farm to farm. The average percent of U.S. No. 1 for all entries on the four farms graded was 84%.

Soil analyses of statewide trial plots - 1989

	Cooperating Farms[z]				
Test Results	1	2*	3	4	5
pH	6.1		5.8	6.8	5.3
P (lb/A)	880		506	90	682
K (lb/A)	424		401	225	245
CA (lb/A)	4150		2790	4850	740
Mg (lb/A)	618		159	699	103
CEC (meg/100g)	16		12	15	5
Ca (% base sat.)	65		59	79	37
Mg (% base sat.)	16		6	19	9
K (% base sat.)	3.4		4.4	1.9	6.3
Zn (lb/A)	16.7		24.3	24.5	12.4
B (lb/A)	1.3		1.2	1.4	.7
OM (%)	2.6		2.4	3.1	.9

[z] 1 - Michael Farms, Urbana
2 - Thompson Farms, Hanoverton
3 - Mellinger Farms, Leetonia
4 - Logan Farms, Mt. Gilead
5 - Chase Farms, Defiance

Soil analyses conducted at Research-Extension Analytical Lab, The Ohio Agricultural Research and Development Center, Wooster.

* Due to an oversight by the OSU-OARDC harvest group, a soil analysis was not conducted for Thompson Farms.

Table 1. Cultural and pest control practices used on Ohio statewide potato trials - 1989.

	Farm 1 (M)	Farm 2 (Th)	Farm 3 (Mel)	Farm 4 (L)	Farm 5 (C)
Date planted	May 31	May 22	May 27	June 1	May 30
Date killed	Frost	September 2	September 12	-	September 23-25
Date harvested	October 5	September 28	September 27	October 4	October 3
1988 crop	Sweet corn	Wheat	Corn	Corn	Potatoes
Cover crop	Rye	Timothy+60 lbs. N	Corn Stalks	Corn Stalks	Nothing
Fertilizer plowed down					
Applied in row	1000 lbs 10-26-26	900 lbs 9-25-25	1000 lbs 10-20-20	lbs 150-175-175 +30# S+15# MgO	112 gal. 5-15-15 60#-180#-180# 30 gal. 28%N
Side dressed	Urea				
Herbicide Incorporated Preemergence	Dual	Lorox + Dual	Dual + Lorox	Dual + Lorox	
Systemic Insecticide	Temik	Thimet	Thimet	Thimet	Temik 18-20#
Spacing	8" x 36"	9" x 36"	8" x 36"	9" x 36"	10-1/2" x 36"
Soil type	Silt loam	Silt loam	Silt loam	Heavy silt loam	Sandy silt loam

Table 2. Rainfall and irrigation records for Ohio statewide potato trial plots - 1989.

	Farm 1 (M)	Farm 2 (Th)		Farm 3 (Mel)	Farm 4 (L)	Farm 5 (C)
Date planted	May 31	May 22		May 27	June 1	May 30
Date killed	Frost	September 22		September 12		September 23-25
Date harvested	October 5	September 28		September 27	October 4	October 3
	Rainfall - Irrig.	Rainfall - Irrig.		Rainfall	Rainfall	Rainfall
				inches		
April	7.4	--		--	--	--
May	5.7	3.5		2.25	--	1.3
June	4.4	8.4		9.80	4.06+[z]	7.1
July	3.6	3.0		2.00	3.37	3.95
August	5.9	2.3	2.5	1.55	1.71	1.05
September	2.9	--		3.10	.92	4.4
Season Total		19.7		18.7	10.06	17.8
June/July/August		16.2		13.35	9.14	12.1
Avg. Yields U.S. No. 1 Main Trials Cwt/A	248			200	225	205

[z]Records start June 12

Table 3. Stand counts for 1989 statewide main trials, observational, and russet trials.

Cultivar	1(M)*	2(Th)	3(Mel)	4(L)	5(C)	Cultivar Mean
	-Cooperating Farms- % Emergence					
	MAIN TRIALS					
Atlantic	92	87	89	91	90	
Kanona(N.Y. 71)	69	86	92	85	83	
LA01-38(LaBelle)	97	70	80	65	78	
Norchip	84	94	86	80	86	
Langlade	93	85	85	78	85	
MS700-83	69	84	89	84	81	
MS716-15	85	75	90	79	82	
Allegany(N.Y. 72)	87	83	87	78	84	
Katahdin	94	81	67	88	82	
Steuben(N.Y. 81)	81	76	78	82	79	
W855	89	79	97	85	87	
MS700-70	-	84	89	99	91	
B7592-1	87	76	90	88	85	
Farm Mean	86	82	86	83	84	
	OBSERVATION TRIALS					
Superior	87	89			88	
Gemchip	84	87			85	
NY 78	77	88			82	
W979	78	89			83	
Kennebec	92	90			91	
Chaleur	88	74			81	
W848	79	90			84	
Farm Mean	84	87			85	
	RUSSET TRIALS					
Rus. Norkotah				77		
W1059				83		
ND1113-10				85		
ND671-4 Rus.				92		
W848				89		
CO8011-5				77		
Farm Mean				84		

* Stand counts were not taken because of wet conditions

Table 4. Percent of B's and culls, major external defects for main trial cultivars. Results are the mean values for four farms, 1989

Cultivar	%B's	% Culls	Major Defects[1] External
LA01-38(LaBelle)	1.7	4.9	Sh. 2nd Cr.
Steuben(N.Y. 81)	1.8	4.5	Sc. Sh. Cr. 2nd
MS700-83	2.6	7.5	Cr. Gr. Sh. Sc.
Atlantic	2.5	2.8	Sh. Gr. 2nd. Sc.
B7592-1	3.3	4.4	Sh. Gr. 2nd. Sc.
W855	5.5	2.1	Sh. Sc.
MS700-70	2.9	5.2	Sh. 2nd. Gr. Sc.
Allegany(N.Y. 72)	2.9	4.5	2nd. Sh. Cr.
Langlade	4.3	5.8	Gr. 2nd. Cr. Sc.
Katahdin	3.1	5.5	Sh. 2nd. Gr. Sc.
Kanona(N.Y. 71)	2.3	3.3	Sc. 2nd. Sh. Gr.
MS716-15	2.5	5.5	Sh. Gr. Sc. 2nd
Norchip	4.4	9.8	2nd. Sh. Cr. Sc.
Average	3.0	5.1	

[1]Abbreviations for external defects:

Sh. = misshapen
2nd = second growth
Cr. = growth cracks
Gr. = greening
Sc. = scab

Table 5. Total yield, percent U.S. No. 1 and marketable yield for main trial potato cultivars, statewide trials - 1989.

Cultivar	Farm 1(M) Yield Cwt/A	Farm 1(M) No.1 %	Farm 1(M) No.1 Cwt/A	Farm 3(Mel) Yield Cwt/A	Farm 3(Mel) No.1 %	Farm 3(Mel) No.1 Cwt/A	Farm 4(L) Yield Cwt/A	Farm 4(L) No.1 %	Farm 4(L) No.1 Cwt/A	Farm 5(C) Yield Cwt/A	Farm 5(C) No.1 %	Farm 5(C) No.1 Cwt/A	Mean of 4 Farms Yield Cwt/A	Mean of 4 Farms No.1 %	Mean of 4 Farms No.1 Cwt/A
LA01-38(LaBelle)	315	90	283	212	86	182	245	93	228	200	78	156	243	87	211
Steuben(N.Y. 81)	291	87	253	206	89	183	261	89	232	229	85	195	247	87	215
Langlade	280	87	244	177	83	147	247	85	210	198	65	129	235	80	188
MS700-70	276	80	221	226	83	188	230	95	218	159	77	122	223	84	187
Allegany(N.Y. 72)	254	88	223	209	81	169	199	92	183	201	80	161	216	85	184
Kanona(N.Y. 71)	251	88	221	170	75	127	174	88	153	189	85	161	196	88	172
Atlantic	245	90	220	158	90	142	261	92	240	203	85	173	217	89	193
Norchip	241	84	202	170	75	127	221	76	168	262	52	136	223	72	161
B7592-1	238	80	190	240	88	211	228	87	198	203	83	168	227	84	191
Katahdin	219	85	186	240	85	204	179	88	158	217	74	161	214	83	178
MS700-83	211	76	160	213	83	177	308	86	263	250	74	185	245	80	196
MS716-15	209	78	163	208	89	185	196	90	176	139	79	110	188	84	158
W855	198	81	160	176	85	150	202	91	184	211	83	175	197	85	167
Mean	248	84	208	200	85	170	225	89	200	205	77	158	221	84	186

Table 6. Total yield, percent U.S. No. 1 and marketable yield for observational potato cultivars, statewide trials, 1989.

	Farm 3 (Mel)		
	Yield	No.1	No.1
Cultivar	Cwt/A	%	Cwt/A
Chaleur	173	80	138
W979	142	81	115
NY 78	118	88	104
W848	118	81	96
Superior	116	77	89
Kennebec	101	76	77
Gemchip(BR 7093-24)			
Mean	128	80.5	103

Table 7. Total yield, percent U.S. No. 1 and marketable yield for russet trial cultivars, statewide trials - 1989.

	Farm 1(M)			Farm 5(C)			Mean of 2 Farms		
	Yield	No.1	No.1	Yield	No.1	No.1	Yield	No.1	No.1
Cultivar	Cwt/A	%	Cwt/A	Cwt/A	%	Cwt/A	Cwt/A	%	Cwt/A
Russet Norkotah	190	80	152	80	64	51	135	72	97
W1059	183	69	126	92	53	49	137	61	84
ND1113-10	153	66	101	41	32	13	97	49	48
ND671-4 Rus	142	66	94	71	58	41	106	62	66
W848	232	71	165	63	60	38	147	65	96
CO8011-5	127	68	86	79	70	55	103	69	71
Mean	171	70	120	71	56	40	121	63	77

Table 8. Mean U.S. No. 1 yields in cwt per acre for major entries in the Ohio statewide potato trials of all farms each year grown in the last ten years and grown more than one year.

Cultivar	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Early and Med. Early										
Jemseg	207	294	161							
Superior									131	
Conestoga			141	230	266	321	225			
Rus. Norkotah							272	105		
Early Midseason										
Crystal	273	254								
Langlade	296	311	388						184	188
Norchip	201	231	337	184	208	228	301	236	160	161
Midseason										
LA01-38(LaBelle)						359	413	330	235	211
Katahdin	267	292	374	238	315	335	363	276	187	178
Late										
Denali	316	269	300	206						
Elba (NY59)		324	373	245			393			
Neb. A 129-69-1	320	336	341	207	278					
WNC521-12						325	344			
MS700-70								241	233	187

Some of the cultivars grown in Ohio for which the characteristics are well known after several years of testing have been omitted in later years. Some cultivars listed were included in the trials prior to the last ten years. Among these are Shurchip, Monona, Kennebec, Atlantic, Crystal, Sebago, Red Pontiac, Red LaSoda, etc. Katahdin, Norchip and Superior are well known and used as standards for comparison.

Table 9. Specific gravity, chip color, percent blister, and Agtron E-5F readings of potato cultivars grown at four farms in statewide trials, 1989

	Farm 1 (M)				Farm 3(Mel)				Farm 4 (L)				Farm 5 (C)			
Cultivar	Specific Gravity	Chip[y] Color	% Blister[z]	Agtron	Specific Gravity	Chip Color	% Blister	Agtron	Specific Gravity	Chip Color	% Blister	Agtron	Specific Gravity	Chip Color	% Blister	Agtron
LAO1-38	1.073	2	10	34.8	1.073	3	20	39.5	1.083	3	20	34.8	1.060	3	10	41.5
Steuben	1.073	4	30	32.4	1.083	3	10	38.7	1.088	4	60	29.2	1.060	4	20	33.3
MS700-83	1.069	4	10	34.7	1.083	3	10	38.7	1.080	4	10	32.2	1.068	4	30	24.1
Atlantic	1.075	3	40	30.5	1.097	3	30	41.7	1.097	4	40	34.9	1.070	5	20	24.1
B7592-1	1.063	4	20	32.2	1.084	2	30	40.7	1.078	4	30	29.1	1.066	4	40	31.7
W855	1.072	2	30	34.8	1.089	3	40	34.1	1.089	4	40	29.8	1.060	3	10	40.9
MS700-70	1.070	4	30	31.6	1.089	3	10	35.8	1.083	3	20	34.6	1.069	3	20	39.4
Allegany	1.067	3	10	38.0	1.088	2	30	43.1	1.075	3	10	35.6	1.068	4	40	32.2
Langlade	1.060	3	10	29.2	1.078	1	20	39.3	1.064	3	10	36.3	<1.060	4	30	30.0
Katahdin	1.066	4	20	38.4	1.077	4	30	31.3	1.072	4	50	30.6	<1.060	4	10	33.2
Kanona	1.064	3	30	34.8	1.074	3	30	41.7	1.074	3	20	37.1	<1.060	4	20	30.1
MS716-15	1.077	3	20	30.6	1.092	3	30	35.7	1.084	4	70	31.9	1.072	3	20	32.9
Norchip	1.065	3	10	37.1	1.082	3	60	37.2	1.080	4	20	30.3	1.062	3	20	41.6
Farm Mean	1.069	3.2	20.8	33.8	1.084	2.8	26.9	38.3	1.081	3.6	30.8	32.8	1.064	3.7	22.3	33.5

[y] PC/SFA Standards

[z] Percentage of chips that develop blisters >20 mm in diameter during the frying process.

Table 10: Mean specific gravity, chip color, percent blister and Agtron E-5F readings based on statewide potato cultivar trials from four farms - 1989

Cultivar	Specific Gravity	Chip Color[y]	% Blister[z]	Agtron
LA01-38(LaBelle)	1.072	2.7	15	37.6
Steuben	1.076	3.7	30	33.4
MS700-83	1.075	3.7	15	32.4
Atlantic	1.085	3.7	32.5	32.8
B7592-1	1.073	3.5	30	33.4
W855	1.077	3	30	34.9
MS700-70	1.078	3.2	20	35.4
Allegany	1.074	3	22.5	37.2
Langlade	1.066	2.7	17.5	33.7
Katahdin	1.069	4	27.5	33.4
Kanona	1.068	3.2	25	35.9
MS716-15	1.081	3.2	35	32.8
Norchip	1.072	3.2	27.5	36.6
Mean	1.074	3.3	25.2	34.6

[y] PC/SFA standards
[z] Percentage of chips that develop blisters >20 mm in diameter during the frying process

Observation Trials (Wooster) Table 1. Total yields, U.S. No. 1 yields, grade distribution, specific gravity, chip color, percent blister and Agtron readings for Observation entries, 1989

Cultivar	Total Yield cwt/A	U.S. No. 1 cwt/A	U.S. No. 1	B. Size	Culls	Scab Area Type[Z]	Specific Gravity	Chip Color[Y]	% Blister[X]	Agtron E-5F
			- - - - - % - - - - -							
B0909-17	75	*	*	*	*	0				
B0437-11	44	*	*	*	*	0				
B0220-14	150	*	*	*	*	0	1.093	2	0	43.8
B0424-31	126	44	35	26	39	0				
BC0038-1	39	*	*	*	*	1-1	1.078	1	20	39.3
C08195-4	106	55	52	15	33	0	1.083	3	10	38.7
AC81198-11	97	*	*	*	*	0				
AC77101-1	73	*	*	*	*	0	1.088	2	30	43.1
C08182-1	102	*	*	*	*	T-1	1.077	4	30	31.3
BC0224-3	97	*	*	*	*	0				
AC7869-17	63	*	*	*	*	0	1.089	3	40	34.1
Saginaw Gold	109	*	*	*	*	T-1				
BR7093-24	136	99	73	8	19	0				
A76147-2	169	*	*	*	*	0				
A7411-2(5001)	126	81	64	19	17	0				
C08138-6(1608)	75	*	*	*	*	0				
C07918-11(1003)	48	*	*	*	*	T-1	1.069	3	10	40.1
ND2207-8 RUSS	77	*	*	*	*	0				
ND2141-4 RUSS	121	35	29	22	49	0	1.083	4	20	31.9
A74114-4(Frontier Russ)	119	71	60	17	23	0				
AF564-2	87	*	*	*	*	T-1	1.077	4	10	36.9
Russet Norkotah	155	101	65	10	25	0				
Highlat Russet	102	*	*	*	*	T-1				
FL657	128	92	72	8	20	T-1				
F72090(Chaleur)	106	74	70	12	18	0				
B7592-1	165	84	51	25	24	0	1.084	3	10	38.2

[X] Pecentage of chips that develop blisters > 20 mm in diameter during the frying process

[Y] PC/SFA standards

[Z] Area - T-less than 1%; 1-10-20%; 2-21-40%; 3-41-60%; 4-61-80%; 5-81-100%.
Type - 1. Small, superficial; 2. Larger, superficial; 3. Larger, rough pustules; 4. Larger pustules, shallow holes; 5. Very large pustules, deep holes

* Sample size inadequate for grading

Observation Trials (Wooster) Table 2. Tuber data, external defects and internal disorders for observation entries, 1989.

	- - Tuber Data[z] - -					--% External defects --	- Internal Disorders[y] -					
Cultivar	Tuber Color	Skin Texture	Tuber Shape	Eye Depth	Overall Appear	Growth cracks	2nd Growth	Sun Grn	defect Free	HH	Int. Nec	Defect Free
B0309-17	5	3	6	6	1	0	85	5	15	1	0	9
B0437-11	5	3	4	6	4	15	15	0	70	0	0	10
B0220-14	6	5	5	6	4	10	20	10	65	0	0	10
B0424-31	7	7	5	5	3	0	40	5	60	0	0	10
BC0038-1	7	7	5	5	3	0	15	10	75	0	0	10
C08195-4	5	3	5	6	4	0	30	0	70	0	1	9
AC81198-11	5	3	5	6	4	0	30	0	70	0	3	7
AC77101-1	5	4	6	5	5	0	15	0	85	0	1	9
C08182-1	7	7	5	6	5	0	25	0	75	0	0	10
BC0224-3	5	5	6	5	2	0	50	10	45	0	2	8
AC7869-17	5	3	3	5	5	10	25	0	65	0	0	10
Saginaw Gold	6	6	3	6	4	5	40	0	60	0	0	10
BR7093-24	7	7	3	5	6	0	5	5	90	0	1	9
A76147-2	7	7	6	7	5	0	40	0	60	0	2	8
A7411-2(5001)	6	4	6	6	5	20	15	0	65	0	0	10
C08138-6(1608)	6	4	5	5	5	0	30	0	70	0	0	10
CO7918-11(1003)	6	5	5	5	3	30	25	5	45	0	1	9
ND2207-8 RUSS	5	4	6	7	3	0	30	0	70	0	0	10
ND2141-4 RUSS	5	4	6	6	3	15	45	0	45	0	0	10
A74114-4(Frontier Rus)	6	4	5	5	7	0	0	5	95	0	1	9
AF564-2	6	7	3	5	4	5	25	5	75	0	3	7
Russet Norkotah	5	3	6	5	6	0	15	0	85	0	0	10
Highlat Russet	7	6	6	5	5	5	30	5	65	0	0	10
FL657	7	7	3	6	5	5	20	0	75	0	1	9
F72090(Chaleur)	7	7	3	6	8	0	15	0	85	0	0	10
B7592-1	8	8	3	8	7	0	10	0	90	0	0	10

[y] Hollow heart and internal necrosis ratings indicate the number of affected tubers found per 10 tubers sampled

[z] Tuber Data Rating System
Tuber Color: 1) purple 2) red 3) pink 4) dark brown 5) brown 6) tan 7) buff 8) white 9) cream
Skin Texture: 1) part. russet 2) heavy russet 3) mod. russet 4) light russet 5) netted 6) slight net. 7) mod smooth 8) very smooth
Tuber Shape: 1) round 2) mostly round 3) round to oblong 4) mostly oblong 5) oblong 6) oblong to long 7) mostly long 8) long 9) cylindrical
Eye Depth: 1) very deep 2) -- 3) deep 4) -- 5) intermediate 6) -- 7) shallow 8) -- 9) very shallow
Appearance: 1) very poor 2) -- 3) poor 4) -- 5) fair 6) -- 7) good 8) -- 9) excellent

Advanced Observation Trials (Wooster) Table 1. Total yields, U.S. No. 1 yields, grade distribution, specific gravity, chip color, percent blister and Agtron readings for advanced observation entries, 1989.

Cultivar	Total Yield cwt/A	U.S. No. 1 cwt/A	U.S. No. 1	B. Size	Culls	Scab Area Type[Z]	Specific Gravity	Chip Color[Y]	% Blister[X]	Agtron E-5F
			- - - - - - % - - - - - -							
MN13543	61	16	26	18	56	0	1.074	2	30	48.4
MN13653	67	35	52	7	41	T-1	1.082	2	20	41.6
MN10874	162	110	68	15	17	0	1.084	3	40	22.5
AC80545-1	130	79	61	8	31	0	1.078	3	40	52.8
BR7093-24(Gemchip)	158	122	77	11	12	T-1	1.087	3	30	48.7
MS702-80	155	118	76	10	14	0	1.086	2	10	47.7
W1024	99	56	57	12	31	0	1.088	3	20	41.6
W979	123	77	63	14	23	1-1	1.080	2	20	45.0
AF875-16	117	88	75	8	17	0	1.096	2	20	48.2
AF1060-2	122	63	52	20	28	T-1	1.085	3	40	41.1
CS7635-4	99	61	62	12	26	T-1	1.084	3	20	47.1
BO242-2	146	89	61	20	19	0	1.080	3	10	41.5
AF74114-4	108	59	55	19	26	0	1.088	3	30	41.5
B9792-61	73	49	67	28	5	0	1.083	3	50	42.1
LA01-38(LaBelle)	88	55	63	10	27	0	1.080	2	30	48.0

[X] Pecentage of chips that develop blisters > 20 mm in diameter during the frying process
[Y] PC/SFA standards
[Z] Area - T-less than 1%; 1-10-20%; 2-21-40%; 3-41-60%; 4-61-80%; 5-81-100%.
Type - 1. Small, superficial; 2. Larger, superficial; 3. Larger, rough pustules; 4. Larger pustules, shallow holes; 5. Very large pustules, deep holes

Advanced Observation Trials (Wooster) Table 2. Tuber data, external defects and internal disorders for advanced observation entries, 1989.

	Tuber Data[z]					% External defects					Internal Disorders[y]	
Cultivar	Tuber Color	Skin Texture	Tuber Shape	Eye Depth	Overall Appear	Growth cracks	2nd Growth	Sun Grn	Defect Free	HH	Int. Nec	Defect Free
MN13543	5	4	4	6	3	0	40	5	55	0	0	10
MN13653	7	6	5	7	2	10	25	5	60	1	0	9
MN10874	5	3	3	6	6	5	10	0	85	0	0	10
AC80545-1	6	5	3	6	3	0	25	0	65	0	0	10
BR7093-24(Gemchip)	7	8	3	7	6	0	0	15	85	0	0	10
MS702-80	7	5	3	5	6	5	10	0	85	0	0	10
W1024	7	7	4	8	6	5	5	5	85	0	1	9
W979	7	6	3	5	5	15	10	5	75	0	1	9
AF875-16	7	6	3	5	7	0	0	10	90	0	0	10
AF1060-2	7	7	3	6	3	10	15	20	60	0	0	10
CS7635-4	7	7	3	5	4	10	15	15	65	0	1	9
BO242-2	7	7	3	5	4	0	20	15	70	0	3	7
AF74114-4	5	3	6	6	7	0	15	0	85	0	0	10
B9792-61	6	5	2	6	6	10	15	5	75	0	0	10
LA01-38(LaBelle)	7	6	3	4	6	0	15	0	85	0	2	8

[y] Hollow heart and internal necrosis ratings indicate the number of affected tubers found per 10 tubers sampled

[z] Tuber Data Rating System

Tuber Color: 1) purple 2) red 3) pink 4) dark brown 5) brown 6) tan 7) buff 8) white 9) cream

Skin Texture: 1) part. russet 2) heavy russet 3) mod. russet 4) light russet 5) netted 6) slight net. 7) mod smooth 8) very smooth

Tuber Shape: 1) round 2) mostly round 3) round to oblong 4) mostly oblong 5) oblong 6) oblong to long 7) mostly long 8) long 9) cylindrical

Eye Depth: 1) very deep 2) -- 3) deep 4) -- 5) intermediate 6) -- 7) shallow 8) -- 9) very shallow

Appearance: 1) very poor 2) -- 3) poor 4) -- 5) fair 6) -- 7) good 8) -- 9) excellent

1989 NORTH CENTRAL REGIONAL POTATO TRIALS

Location Wooster, Ohio Soil Type Wooster Silt Loam

Fertilizer Treatment 1200 lbs. 10-20-20 Date Planted May 19, 1989

Date Harvested September 14, 1989 Size of Plots single rows - 30 ft.

Spacing - Between Hills 12 inches Spacing - Between Rows 36 inches

Replications 30 hills/rep Number of Replications 3

Environmental Factors (rainfall, temperature, irrigations, etc.):

	Rainfall (in.)		Temperature (^{o}f)	
	1989	80 yr mean	Ave. Min	Ave. Max.
May	4.5	4.0	48	66
June	7.2	4.0	57	79
July	1.7	4.2	62	85
August	0.9	3.7	57	82
September	4.4	3.2	52	75

Sprays Applied:

1 application - Dithane M45 + Thiodan
2 applications - Dithane M45 + Asana
2 applications - Dithane M45 +Penncap
3 applications - Bravo 500 + Guthion
1 application - Bravo 500

Other Data (vine killing, specific gravity determinations, etc.):

Herbicide: Dual/Lexone
Vine Killing: Diquat + spreader (Sept. 1)
Previous Crop: Plow down alfalfa

Specific gravity determined using weight in air - weight in water method, and solids determined by tabular conversion.

Beating rains early in growing season compacted soil, which apparently reduced stolon growth and tuber development.

A severe infestation of Colorado potato beetles caused premature senescence, and plant death in some plots.

SUMMARY SHEET

Selection Number or Variety	Aver. (1) Mat.	Most (2) Representive Scab Area-Type (A-T)	CWT/A Aver. Yield	CWT/A Yield US #1	Aver. Percent US #1	Aver. (3) % Total Solids	Gen (4) Merit Rating	Chip (5) Color	Early (6) Blight Reading	Comments and General Notes
EARLY TO MEDIUM MATURITY										
Norland	1	0-0	159	116	73	12.63		4		deep eyes
Norgold Russet	3	0-0	125	65	52	13.62		4		offshape, and 2nd growth
Norchip	4	1-1	124	62	50	14.62		3		wide range in tuber size
ND1196-2R	1	0-0	56	not graded		13.42	4	3		promising red in stress
MEDIUM LATE TO LATE MATURITY										
MN13420	1	0-0	100	39	39	13.42		3		purple skin, misshapened tubers
MN13451	2	0-0	52	not graded		12.83		3		variable size, poor yiel
MN13545	No data - sample not available for planting -									
MS700-70	4	1-1	59	not graded		14.22		3		irreg. tuber surface, po y
NEA219.70-3	2	1-2	156	81	52	13.82		4		deep eyes/apical end
NEA22.75-1	3	0-0	118	76	64	13.42	1	3		good size; yld potential
BN9826-1	4	0-0	93	43	46	13.82		4		field sprouts, offshape 2nd grow
ND2224-5R	3	No sample	32	not graded		11.43	3	4		promising red; very low y
ND1538-1Russ	2	0-0	104	29	28	14.62		4		variable shape. irrig. o sand
W855	4	0-0	53	not graded		15.81	2	3		small tubers, but unif sha
W1005	5	0-0	116	42	36	15.81	5	4		low gradeout; irrig. on sand
Red Pontiac	5	0-0	173	85	49	14.62		2		light red color, irreg s
Russet Burbank	5	0-0	119	18	15	14.02		4		typ. misshapened respons (O
AVERAGE*	3		102	60	42	14.7		3.4		

* Please Average

1) 1-Very Early - Norland maturity; 2-Early - Irish Cobbler maturity; 3-Medium - Red Pontiac maturity; 4-Late - Katahdin maturity; 5-Very Late - Kennebec or Russet Burbank maturity.

2) **AREA:** T-less than 1%; 1 - 10-20%; 2 - 21-40%; 3 - 41-60%; 4 - 61-80%; 5 - 81-100%. **TYPE:** 1. Small, superficial; 2. Larger, superficial; 3. Larger, rough pustules; 4. Larger pustules, shallow holes; 5. Very large pustules, deep holes.

3) Percent total solids, not total solids/acre

4) Place top five among all entries including check varieties; disregard maturity classification. (Rate first, second, third fourth and fifth (in order) for overall worth as a variety).

5) Chip Color - PCII Color Chart or Agtron. Indicate what Agtron you are using.

6) Early Blight: 1 - susceptible; 5 - highly resistant.

SUMMARY OF GRADE DEFECTS

Selection Number or Variety	Percent External Defects (1)					Total (3) Tubers Free of External Defects	Percent Internal Defects (1)			
	Scab (2)	Growth Cracks	Off Shape and Second Growth	Sun Green	Tuber Rot		Hollow Heart	Internal Necrosis	Vascular Discoloration	Normal Tubers (4)
EARLY TO MEDIUM MATURITY										
Norland	0	0	5	5	0	90	0	0	0	100
Norgold Russet	0	0	40	0	0	60	0	0	0	100
Norchip	5	0	35	15	0	45	0	0	0	100
ND1196-2R	0	0	10	0	0	90	0	0	0	100
MEDIUM LATE TO LATE MATURITY										
MN13420	0	5	65	0	0	30	0	0	0	100
MN13451	0	0	45	0	0	55	0	0	0	100
MN13545	- - -	- - No	data -	- - -	- - - -	- - - -	- - -	- - - -	- - - - -	- - - - -
MS700-70	10	0	15	10	0	65	0	0	0	100
NEA219.70-3	10	0	25	0	0	65	0	0	0	100
NEA22.75-1	0	0	20	0	0	80	0	0	0	100
BN9826-1	0	0	45	0	0	55		10	20	70
ND2224-5R	- - - -	No sample	- - - -	- - -	- - -	- - - - -	- - - -	- - - - -	- - - - -	- - - - -
ND1538-1Russ	0	0	35	-	-	65	0	0	0	100
W855	0	0	10	0	0	90	10	0	0	90
W1005	0	0	30	0	0	70	0	0	0	100
Red Pontiac	0	5	40	0	0	55	0	0	0	100
Russet Burbank	0	0	85	0	0	15	0	0	0	100
AVERAGE*	1.7	.7	33.7	2	0	62	.7	.7	1.3	97

*** Please average**

(1) Based on four 25 tuber samples (one from each replication). Percentage based on number of tubers.

(2) Includes <u>all</u> tubers with scab lesions whether merely surface, pitted or otherwise and regardless of area. <u>Be sure</u> to count tubers with any amount of scab in this category.

(3) This total - tubers free from any external defect of any sort.

(4) Percentage normal tubers are those showing no internal defects. Some individual tubers will have more than one type of internal defect.

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OHIO
Mark Bennett, Art Bisges, David Kelly,
Matt Kleinhenz, Floyd Lower, and Gene Wittmeyer
The Ohio State University

Introduction: Thirty-four varieties and clones were tested in 1989 at the Ohio Agricultural Research and Development Center, Wooster as part of the NE107 Regional Project (Breeding and Evaluation of Potato Clones for the Northeast).

Methods: Plots were planted on May 19, 1989 with 30 hills, 1 foot apart, in rows 36 inches apart. A randomized complete block design with 3 replications was used. Soil type was a Wooster silt loam (fine-loamy, mixed, mesic Typic Fragiudalf) with a pH of 6.0 and organic matter of 3.0%. Fertilization consisted of 1200 lbs/A 10-20-20, one-half applied at plow-down, and the remainder banded at planting. Herbicides used were Dual/Lexone. Pesticides included Dithane M45, Bravo 500, Thiodan, Pydrin, and Penncap. Plots were mechanically harvested on September 14, 1989. Chip samples were held at ambient air temperature and chipped 48 days after harvest. Chip color was evaluated using the standards established by the Potato Chip/Snack Food Association (PC/SFA). Objective color measurements were made with the Agtron E-5F. Specific gravity was determined using the potato hydrometer method. Hollow heart and internal necrosis ratings (Ohio Table 2) indicate the number of affected tubers found per 30 tubers examined.

Results: The 1989 growing season was excessively wet during May and June. Colorado Potato Beetle injury was severe throughout the season despite attempts at chemical control. Top yielding entries were Monona, LA01-38, B0242-2, B9792-8B, B9792-157, and WNC672-2. Of this group, LA01-38, B0242-2, and B9792-157 had U.S. 1 grades ranging from 74-82% of total yield. Fourteen varieties/clones produced marketable yields that were greater than the standard variety Katahdin (Ohio Table 1). Percentage of total yield of these varieties which was classified as U.S. No. 1 ranged from 58-87%.

Ohio Table 1. Yield, marketable yield, percentage of yield by grade size distribution and specific gravity for varieties grown at Wooster, Ohio - 1989

Variety	Total Yield CWT/A	Marketable Yield CWT/A	% of STD	Size Distribution by Class (% of total yield) U.S. No.1 (>1-7/8")	B Size	Culls	Spec. Gravity
Atlantic	169	127	119	75	10	15	1.098
Chaleur(F72090)	121	83	78	69	7	24	1.075
Coastal Russet	141	61	57	43	24	33	1.079
Jemseg	140	52	49	37	9	54	1.078
Kanona(N.Y.71)	138	109	102	79	8	13	1.066
Katahdin (std)	149	107	100	72	10	18	1.076
Kennebec	190	95	89	50	17	33	1.081
Monona	196	110	103	56	13	31	1.080
Norchip	169	86	80	51	28	21	1.090
Norland	168	136	127	81	10	9	1.071
Russet Burbank	191	37	35	19	42	39	1.077
Somerset	185	157	147	85	11	4	1.079
Superior	148	96	90	65	18	17	1.084
A7411-2	124	68	64	55	30	15	1.091
AF875-16	165	81	76	49	18	33	1.103
AF1060-2	190	118	110	62	23	15	1.084
B0045-6	158	90	84	57	17	26	1.091
B0220-14	123	57	53	46	22	32	1.089
B0242-2	207	153	143	74	16	10	1.073
B0257-3	189	123	115	65	24	11	1.098
B9792-2B	113	62	58	55	26	19	1.100
B9792-8B	240	144	135	60	20	20	1.099
B9792-157	206	169	158	82	8	10	1.086
B9792-158	106	67	63	63	22	15	1.088
CS7635-4	169	98	92	58	12	30	1.074
CS7639-1	147	100	93	68	8	24	1.075
F77087	130	78	73	60	16	24	1.079
LA01-38	246	179	192	78	15	7	1.095
NY72 (Allegany)	145	100	93	69	11	20	1.084
NY78	133	96	90	72	14	14	1.073
NY81 (Steuben)	185	124	116	67	10	23	1.087
WF31-4	168	146	136	87	7	6	1.095
WNC672-2	227	132	123	58	18	24	1.080
73C26-1	140	67	63	49	32	19	1.080
W.D. LSD (K=100, 5% level)	73						

Ohio Table 2. Tuber shape and appearance, tuber defects, hollow heart ratings, internal necrosis ratings and chip color for varieties grown at Wooster, Ohio - 1989

	Tuber data[1]				- - Tuber defects(%) - -			Hollow	Internal	
Variety	Maturity	Shape	Appear-ance	Total	Sun-burn	Mis-shapen	Growth Cracks	Heart Rating	Necrosis Rating	Chip[2] Color
Atlantic	6	2	6	10	2	5	3	0	5	4
Chaleur(F72090)	1	4	6	9	2	7	0	0	0	4
Coastal Russet	4	5	5	37	2	25	10	0	1	4
Jemseg	3	3	5	35	10	0	25	0	0	4
Kanona(N.Y.71)	3	3	6	9	2	7	0	0	3	3
Katahdin	9	3	5	14	2	12	0	1	17	4
Kennebec	8	4	3	47	12	32	3	0	0	4
Monona	6	3	5	20	0	20	0	0	9	4
Norchip	5	4	3	51	13	35	3	0	4	3
Norland	1	3	7	5	0	3	2	0	0	4
Russet Burbank	8	7	1	95	0	95	0	0	0	4
Somerset	7	4	7	20	20	0	0	0	0	3
Superior	9	3	5	32	3	27	2	0	1	4
A7411-2	7	6	6	17	0	17	0	0	0	4
AF875-16	6	3	5	20	5	10	5	0	1	3
AF1060-2	5	2	6	9	0	7	2	0	1	3
B0045-6	6	4	5	28	0	25	3	0	0	3
B0220-14	5	5	5	31	0	28	3	0	0	3
B0242-2	4	2	5	20	2	15	3	1	2	3
B0257-3	4	3	7	2	0	0	2	0	1	4
B9792-2B	5	2	5	3	0	0	3	0	3	3
B9792-8B	8	4	3	35	5	27	3	0	5	4
B9792-157	5	2	3	31	0	28	3	2	0	3
B9792-158	6	4	4	30	7	23	0	1	3	4
CS7635-4	8	3	4	38	0	25	13	0	1	3
CS7639-1	5	3	3	38	8	27	3	0	0	3
F77087	5	3	5	8	5	3	0	0	0	4
LA01-38	6	3	6	17	2	15	0	0	1	3
NY72(Allegany)	8	2	5	10	0	8	2	0	2	3
NY78	8	3	5	17	2	8	7	0	0	3
NY81(Steuben)	8	3	6	25	7	8	10	0	8	3
WF31-4	4	3	7	10	0	0	10	0	0	4
WNC672-2	7	2	6	7	0	7	0	0	10	4
73C26-1	5	3	6	15	0	10	5	0	0	3

[1] See standard NE107 rating system [2]PC/SFA Standards

Ohio Table 3. Plant stand, percent blister, Agtron readings, and additional tuber data for varieties grown at Wooster, Ohio - 1989

Variety	% Plant Stand	% Blister[1]	Agtron E-5F	Tuber Data		
				Skin Texture	Eye Depth	Skin Color
Atlantic	74	20	40.1	5	5	7
Chaleur(F72090)	73	20	30.2	8	6	7
Coastal Russet	83	40	29.8	5	5	7
Jemseg	76	30	33.3	6	7	5
Kanona(N.Y.71)	92	40	34.9	7	5	7
Katahdin	76	40	33.9	7	4	7
Kennebec	90	10	38.1	7	6	7
Monona	97	30	33.0	7	4	7
Norchip	92	10	29.8	7	5	7
Norland	77	30	34.6	7	6	2
Russet Burbank	90	40	27.5	3	4	4
Somerset	82	20	36.3	7	7	6
Superior	76	40	40.6	6	5	7
A7411-2	92	50	31.8	4	7	5
AF875-16	89	10	40.5	7	6	7
AF1060-2	77	20	37.4	7	5	7
B0045-6	81	10	37.8	4	7	4
B0220-14	81	20	36.9	4	6	5
B0242-2	78	30	32.6	7	5	7
B0257-3	89	20	28.2	7	7	7
B9792-2B	87	40	38.6	5	5	7
B9792-8B	87	50	33.6	7	6	7
B9792-157	86	10	32.4	5	3	6
B9792-158	57	20	38.1	6	5	6
CS7635-4	84	20	32.1	7	5	6
CS7639-1	83	30	35.2	6	5	6
F77087	74	30	31.0	7	7	7
LA01-38	89	20	38.3	6	6	7
NY72 (Allegany)	89	10	35.8	5	5	7
NY78	69	20	35.4	7	6	6
NY81 (Steuben)	61	30	37.3	6	6	7
WF31-4	84	30	31.9	3	6	6
WNC672-2	92	60	30.5	4	5	7
73C 26-1	90	30	35.0	7	5	6

[1] Percentage of chips that develop blisters greater than 20 mm in diameter during the frying process

TUBER DATA RATING SYSTEM

for

POTATO VARIETY TRIALS - NE107

Tuber Color

1. Purple
2. Red
3. Pink
4. Dark Brown
5. Brown
6. Tan
7. Buff
8. White
9. Cream

Skin Texture

1. Part. russet
2. Heavy russet
3. Mod. russet
4. Light russet
5. Netted
6. Slight net.
7. Mod. smooth
8. Smooth
9. Very smooth

Tuber Shape

1. Round
2. Mostly Round
3. Rd. to obl.
4. Mostly obl.
5. Oblong
6. Obl. to long
7. Mostly long
8. Long
9. Cylindrical

Eye Depth

1. VD
2. --
3. D
4. --
5. Intermediate
6. --
7. S
8. --
9. VS

Appearance

1. Very poor
2. --
3. poor
4. --
5. Fair
6. --
7. Good
8. --
9. Excellent

LOCATIONS OF 1989 OHIO POTATO VARIETY TRIALS

1. Michael Farms, Urbana
2. Harold Thompson Farm, Hanoverton
3. Mellinger Farms, Leetonia
4. Logan Farms, Mt. Gilead
5. Chase Farms, Defiance
6. Ohio Agricultural Research and Development Center, Wooster

Appendix A. Summary of reported general merit ratings for varieties in the 1989 North Central Regional Potato Trials.

Variety	IA	IN	KY	LA	Manitoba	MI	MN	MO	ND	NE	OH	SD	WI	Total n	Total pts.	Total Avg. Rating
Early to Medium Maturity																
Norland	4				1				3					3	8	2.7
Norgold Russet			5				5			4				3	14	4.7
Norchip				5				3		5				3	13	4.3
ND1196-2R	3	4							5		4			4	16	4.0
Medium Late to Late Maturity																
MN13420							4			2				2	6	3.0
MN13451			4											1	4	4.0
MN13545														--	--	--
MS700-70		3	1	2		2	3	2		1		5	3	9	22	2.4
NEA 219.70-3	5		3											2	8	4.0
NEA22.75-1	1			3	4			4			1	1		6	10	1.7
BN9826-1			2											1	2	2.0
ND2224-5R				4	3	5			1		3		4	6	20	3.3
ND1538-1 Russ		2			5	4	1		2				5	6	19	3.2
W855		1		1		3		1	4	3	2	4	1	9	20	2.2
W1005		5				1	2	5			5	2	2	7	22	3.1
Red Pontiac	2				2							3		3	7	2.3
Russet Burbank														--	--	--

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